

Improvements in and relating to a broadcast network

The present invention relates to delivery of content over a broadcast network
5 and in particular to a broadband digital broadcast network.

Background of the invention

As is well known, broadband digital broadcast (BDB) networks such as the
10 terrestrial Digital Video Broadcast (DVB-T) network are intended to deliver
content in the form of a television broadcast and can also deliver data in a
multicast/unicast. The delivery of data and indeed any other service as a
multicast or unicast requires the presence of some form of conditional access
15 to ensure the content reaches the correct terminal. Furthermore, to provide
interactivity it is necessary to provide a return channel linking a terminal to the
network. In this way, a request for content can be communicated to the
network which may subsequently deliver the content to the terminal.

It has thus been the case that content has been delivered either at the
20 request of the receiving terminal or at the instigation of the network. In the
latter case, the network might receive a request from an external content
provider to deliver content in the form of an advertisement or the like over the
network. Such a request might lead to the content being broadcast, multicast,
or even unicast. However, the decision for a content provider as to how and
25 when to request the delivery of content is hampered by the unidirectional
nature of the network.

Summary of the Invention

30 Thus, according to one aspect of the invention, there is provided a controller
connectable to first and second wireless networks, the controller including a

processor operable to initiate delivery of content by said first network in response to a criterion being met by data derived from said second network.

The invention is particular applicable to content delivery by those networks which either do not have or only posses limited return channel capability. Such networks are not suited to the delivery of targeted content such as, for example, advertising. The invention provides the content provider with the advantage of being able to target the delivery of content much more effectively. Preferably, the second network will be selected to the extent that it can provided data advantageous for targeting delivery of content by the first network. Thus, the second network may be a public land mobile network such as a GSM based network, for example. In which case, data relating to the user activity in the network, such as might be stored in a GSM Home Location Register (HLR) may be provided to the first network, which could be a broadband digital broadcast network exemplified by a Digital Video Broadcast (DVB) network. Advantageously, the data derived from the second network will allow the content provider to tailor content to suit the desired audience. Thus an advertiser will be able to develop content to suit a particular market opportunities.

Preferably, the criterion is established as a function of at least one indicia representative of user activity in said second network. One criterion may be when the data derived from said second network exceeds a predetermined threshold value. Conveniently, more than one indicia may be utilised in generating a criterion for the delivery of content. Advantageously, the selection of an indicia allows a content provider to make an assessment of the intended audience of the content to be delivered. Thus, a geographical indicia might be appropriate where the content relates to a particular location such as the provision of services in an area for example hotel rooms. In which case a level of user activity could be monitored in that area which, when exceeded would trigger the delivery of content. Another example of a geographical indicia could be a concentration of user activity at a particular

venue such as a conference centre or sport stadium. The content provider could then arrange delivery of content appropriate to that venue once a certain threshold of user activity had been reached. An alternative indicia could be an identification of user activity amongst a certain population of users identified to the second network. Such an indicia might rely on profiling by the network, revealing data such as grouping users by the length of time they are active in making use of the network or those whose pattern of use takes them to well defined locations such as airports for example on a regular basis.

Further advantages of the invention stem from the fact that because delivery of content may be initiated or controlled to occur under certain specific conditions, it is possible for the network provider to levy corresponding charges for the delivery of content. This ability is reinforced by the fact that the network operator can clearly identify to a potential content provider the audience available or even more usefully identify a potential audience in advance to which content could be delivered.

The data derived from the second network may comprise a number of connected user terminals to said second network. The first wireless network may be a unidirectional digital broadband network, such as, a Digital Video Broadcast (DVB) network, and the second wireless network may be a bi-directional communications network,

According to a further aspect of the invention, there is provided a content delivery system comprising first and second wireless networks and a controller connected thereto, the controller including a processor operable to initiate delivery of content by said first network in response to a criterion being met by data derived from said second network.

Although the controller might be physically integrated with either the first or second networks, it could be provided as a separate entity in which case the

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Figure 3 is a flowchart illustrating a method for use with the system of Figure 2.

Detailed description of the invention

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Referring to Figure 1, there is shown a typical cellular topology of a public land mobile network (PLMN) 1 covering a region. As is well known to those skilled in the art, the PLMN 1 remains informed of a cell in which a mobile station (MS) is located. Typically, an MS periodically contacts the PLMN 1 and the PLMN 1 stores location information in a database known in the GSM case, at least, as a Home Location Register (HLR) 3. Depending on the particular PLMN 1, the location information stored in the HLR 3 may indicate at best a particular cell in which a MS is located or alternatively, a group of cells. Again depending on the particular PLMN, the HLR 3 will obtain periodic updates of the MS location. The information held in the HLR relating to a MS is, of course, required to enable connection of a call to a MS.

Within the region covered by the PLMN 1, there are a number of cells in which concentrations of MS may, from time to time occur. Thus in Cell C there is located a conference centre, in Cell G an airport and in Cell H a motorway junction. Clearly, any increase in the number of MS in these or indeed any other cell in the PLMN 1 will be represented in the information stored in the HLR 3.

Turning now to Figure 2, this illustrates a content delivery system 5 including a terrestrial broadband digital broadcast (BDB) network 7 namely a digital video broadcast (DVB-T) network. A user equipped with a suitable terminal 9 incorporating a receiver (not shown), display 11 and user interface (not shown) can receive data broadcast by the BDB network 7 from a transmitter 13. The data broadcast by the transmitter 13 is derived from a variety of sources 15 via a gateway 17 and may include IP and Television content.

Frequency (LPRF) or Infrared (IR) connection 25. Alternatively, the MS 3 may be integrated with the terminal 9.

As has been previously mentioned, the SMS 23 already has connections to the gateway 17 and the transmitter head-end equipment 19. It is thus possible for the user to issue requests for specific content via the user interface of the terminal 9 and thus through the MS 9 connected to the PLMN 1. The request is received by the SMS 23 which obtains the content from the gateway 17 and passes it to the head-end 19 for placing into data containers for onward transmission. It should be noted that the request from the user might include content which is not presently being transmitted by the BDB network 7. To ensure that the user only receives the requested content, the data is broadcast with an identifier which the conditional access component in the terminal 9 recognises as being intended for delivery to the user. In the event that the content is received by another terminal 9, the conditional access component of that terminal 9 will prevent delivery of the content.

It will be further noted that Interposed between the HLR 3 and SMS 23, is a controller 27 which although shown as a distinct entity could equally form part of the HLR/PLMN and/or SMS/BDB architecture. The controller 27 monitors the contents of the HLR 3 to identify where user activity in the PLMN 1 meets a pre-defined criterion. Thus, the HLR 3 may be monitored to identify those locations in the PLMN topology where the number of MS exceeds a particular threshold. In those locations where the threshold is exceeded, the controller 27 identifies that a so-called "hot-spot" exists. The controller 27 also includes a database which contains details of the likely source of a hot spot at a particular location. Examples of a potential source of a hot-spot have been mentioned above. Thus, there exists a conference centre, airport and motorway junction within the coverage areas of cells C, G and H respectively. The database also includes an estimate of the likely ratio of MS to active terminals expected according to the category of the potential hot-spot. Thus at a conference centre there is likely to be a strong correlation between the

As will be apparent the profile established by the controller 27 allows careful tailoring of the delivery of content to a group of terminals 9. It will further be appreciated that rather than set a single criterion or threshold in the controller 27 to determine locations having high demand, a set of different thresholds
5 may be set having differing levels of demand thus giving the controller 27 operator the opportunity to provide a more accurate profile to potential content providers together with a correspondingly banded pricing structure.

One example of how an embodiment of the invention might be employed in
10 delivering content to a terminal or terminals is set out below and illustrated in the flowchart of Figure 3..

An advertiser might receive instructions from a client to promote services or goods. For example, a hotel chain may have a large number of rooms
15 available in proximity to the conference centre. The advertiser will, through negotiation with a service provider establish content 30 suitable for promoting the hotel chain. This information could be tailored to suit different localities where rooms were available perhaps by including local tourist information. The service provider will then, on the instructions of the advertiser establish a
20 criterion or trigger level 40 at which the content would be provided both by reference to locality and user profile. This information would be provided to the BDB network operator who would program the controller 27 with the appropriate information. Subsequently, should the trigger be met 50 by user activity in the PLMN network 1 then the delivery 60 of content from the
25 service provider in the format agreed by the advertiser would take place.

Further embodiments of invention are described below:

A controller may be connectable to a wireless unidirectional digital broadband
30 network and to a wireless bi-directional communications network. The controller includes a processor operable to initiate delivery of content via the wireless unidirectional digital broadband network to a determined area. This

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